

**WHAT IS CLAIMED IS;**

527A1 1. A plasma etching method for implementing a specific etching process on a workpiece placed on an electrode provided within a processing chamber by introducing a processing gas into said processing chamber, generating plasma inside said processing chamber with a plasma source and applying biasing power to said electrode, wherein;

an etching step in which the workpiece is etched over a specific length of etching time by applying the biasing power to said electrode and a film formation step in which a protective film is formed as an etching mask at a surface of the workpiece over a specific length of film formation time while the biasing power is cut off are sequentially repeated, with the lengths of individual etching times and individual film formation times adjusted as the etching process progresses.

2. A plasma etching method according to claim 1, wherein:

the lengths of the film formation times are extended relative to the extent to which the etching process has progressed.

3. A plasma etching method according to claim 1, wherein:

the lengths of the film formation times are set at 1 second or longer.

4. A plasma etching method according to claim 1, wherein:

said etching step is implemented as a final step of said etching process.

5. A plasma etching method according to claim 1, wherein:

said film formation step is implemented as a first step of said etching process.

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6. A plasma etching method according to claim 1, wherein:  
the etching target is a silicon oxide film; and  
said processing gas is constituted of a gas containing fluorocarbon gas.

7. A plasma etching method for implementing a specific etching process on a workpiece placed on an electrode provided within a processing chamber by introducing a processing gas into said processing chamber, generating plasma inside said processing chamber with a plasma source and applying biasing power to said electrode, wherein;

an etching step in which the workpiece is etched over a specific length of etching time by applying the biasing power to said electrode and a film formation step in which a protective film is formed as an etching mask at a surface of the workpiece over a specific length of film formation time while the biasing power is cut off are sequentially repeated, with the process starting with said film formation step and ending with said etching step.

8. A plasma etching method according to claim 7, wherein;  
the lengths of individual etching times and individual film formation times are adjusted as said etching process progresses.

9. A plasma etching method according to claim 7, wherein:  
the lengths of individual film formation times are extended relative to the extent to which said etching process progresses.

10. A plasma etching method according to claim 7, wherein:

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the lengths of individual film formation times are set at 1 second or longer.

11. A plasma etching method according to claim 7, wherein:  
the etching target is a silicon oxide film; and  
said processing gas is constituted of a gas containing fluorocarbon gas.

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